

Claim 1 (Amended). A multi-layer, thermoplastic stretch wrap film containing seven polymeric layers, comprising:

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(a) two outer layers, at least one of which having a cling performance of at least 100 grams/inch, said outer layer being selected from the group consisting of linear low density polyethylene, very low density polyethylene, and ultra low density polyethylene resins, said resins being homopolymers, copolymers, or terpolymers, of ethylene and alpha-olefins; and

(b) five inner layers, with each layer being selected from the group consisting of linear low density polyethylene, very low density polyethylene, ultra low density polyethylene, and metallocene-catalyzed linear low density polyethylene resins; said resins are homopolymers, copolymers, or terpolymers, of ethylene and C₃ to C₂₀ alpha-olefins.

Claim 2 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said alpha-olefins are propylene, 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, or 1-octene.

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Claim 4 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said alpha-olefins range from C₃ to C₈.

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Claim 5 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the said alpha-olefin content of said copolymers is 4 to 15% by weight.

Claim 6 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the resin melt index for each outer layer is 0.2 to 10 dg/min.

Claim 7 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the resin melt index for each inner layer is 0.5 to 10 dg/min.

Claim 8 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the resin density for each layer is about 0.860 to 0.940 g/cc.

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Claim ~~10~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein each of the outer layers are 2 to 15 weight percent of the total film weight.

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Claim ~~12~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the second outer layer is a slip layer.

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Claim ~~15~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein each of said outer layers have a thickness of 5 to 7% each of the total thickness of the film, and

each of said five inner layers have a thickness of 5 to 28% each of the total thickness of the film.

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Claim ~~16~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said seven polymeric layers are represented by the following formula: A/C/B/C/D/C/E, wherein the relative thickness of the layers is 10/20/10/20/10/20/10, % thickness, respectively,

wherein layers A and E each comprise a linear low density polyethylene hexene-copolymer, layers B and D each comprising a metallocene catalyzed linear low density polyethylene copolymer, and each layer C comprises a linear low density polyethylene hexene-copolymer.

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Claim ~~17~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim ~~16~~, wherein layers A and E have a melt index of 3.2 dg/min and a density of 0.917 g/cc; layers B and D have a melt index of 2.5 dg/min and a density of 0.917 g/cc; and each layer C has a melt index of 2.0 dg/min and a density of 0.917 g/cc.

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Claim 18 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said stretch wrap film has a MD tensile elongation of 400 to 700 %, a TD tensile elongation of 600 to 900 %, a MD Elmendorf tear of 200 to 400 g/mil, a TD Elmendorf tear of 450 to 700 g/mil, and a F-50 dart impact of from 100 to 300 g.

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Claim 19 (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said seven polymeric layers are represented by the following formula: A/C/B/C/D/C/E, wherein

layer A comprises:

a C₂/C₄/C₆ very low density polyethylene terpolymer with a melt index of 2.5 dg/min and a resin density of 0.910 g/cc, and layer A is 2% of the total thickness of said stretch wrap film, or

a C₂/C₆ linear low density polyethylene copolymer blended with a C₂/C₃ copolymer to form a polymer with a melt index of 2.5 dg/min and a resin density of 0.915 , and layer A is 5% of the total thickness of the stretch wrap film;

layer B and D each comprise:

a C₂/C₆ metallocene catalyzed copolymer resin with a melt index of 1 or 2.5 dg/mm and a resin density of 0.910 g/cc and a melt flow ratio of 16-20 g/10 min; wherein B and D each have a thickness of 7 to 10% of the total thickness of the stretch wrap film;

layers C comprise:

a C₂/C₆ linear low density polyethylene copolymer with a melt index of 2 dg/mm and a resin density of 0.917 g/cc, or

a C₂/C₆ linear low density polyethylene copolymer with a melt index of 2 dg/mm and a resin density of 0.917 g/cc blended with a low density polyethylene homopolymer with a melt index of 0.2 to 2 dg/mm at a ratio of 95:5 to 75:25; wherein the C layers have a combined total thickness of 60 to 81% of the total thickness of the stretch wrap film; and

layer E comprises:

a C₂/C₄ linear low density polyethylene copolymer with a melt index of 2 dg/mm, or

a C₂/C₆ linear low density polyethylene copolymer with a melt index of 3 dg/mm and a resin density of 0.917 g/cc, wherein layer E has a thickness of 5 to 10% of the thickness of the stretch wrap film.

Claim ~~20~~¹⁹ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said seven polymeric layers are represented by the following formula: A/C/B/C/D/C/E, wherein

layer A comprises:

a C₂/C₄/C₆ very low density polyethylene terpolymer with a melt index of 2.5 dg/min and a resin density of 0.910 g/cc, and layer A is 2% of the total thickness of said stretch wrap film, or

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a C₂/C₆ linear low density polyethylene copolymer blended with a C₂/C₃ copolymer to form a polymer with a melt index of 2.5 dg/min and a resin density of 0.915, and layer A is 5% of the total thickness of the stretch wrap film;

layers B and D each comprise:

a C₂/C₆ metallocene catalyzed copolymer resin with a melt index of 1 dg/mm and a resin density of 0.917 g/cc and a melt flow ratio of 16-20 g/10 min; wherein B and D have a thickness of 7 to 10% of the total thickness of the stretch wrap film;

layers C comprises:

a blend of a C₂/C₆ linear low density polyethylene copolymer with a melt index of 1 dg/mm and a low density polyethylene with a melt index of 2 dg/mm in a weight ratio of 95:5 to 75:25; wherein the C layers have a combined total thickness of 60 to 81% of the total thickness of the stretch wrap film; and

layer E comprises:

a C₂/C₄ linear low density polyethylene copolymer with a melt index of 2 dg/mm, or

a C₂/C₆ linear low density polyethylene copolymer with a melt index of 3 dg/mm and a resin density of 0.917 g/cc, wherein layer E has a thickness of 5 to 10% of the thickness of the stretch wrap film.

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Claim ~~21~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said seven polymeric layers are represented by the following formula: A/C/B/C/D/C/E, wherein

layers A and E each comprise:

a C₂/C₄ linear low density polyethylene copolymer with a melt index of 2 dg/min and a resin density of 0.910 g/cc, and layers A and E each are 5 to 10% of the total thickness of said stretch wrap film,

layers B and D each comprise:

a C₂/C₆ linear low density polyethylene copolymer resin with a melt index of 2 dg/mm and a resin density of 0.910 g/cc, and layers B and D each are 7 to 10% of the total thickness of the stretch wrap film; and

layer C comprises:

a blend of a C₂/C₄ linear low density polyethylene copolymer with a melt index of 2 dg/mm and a density of 0.910 g/cc, and the C layers have a combined total thickness of 60 to 81% each of the total thickness.

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Claim ~~22~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein at least one of said five inner layers comprise metallocene catalyzed polyethylene with a melt index of 0.5 to 5 dg/min and a melt flow ratio of 30 to 50 g/10 min, wherein said at least one of said five inner layers is 5 to 80 weight percent of the total film.

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Claim ~~24~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the melt flow index is between 0.2 and 10 dg/min.

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Claim ~~25~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein at least one layer comprises a blend of at least two of said resins.

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Claim ~~26~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein said seven polymeric layers are represented by the following formula: A/C/B/C/D/C/E, wherein the relative thickness of the layers is 7/24/7/24/7/24/7, % thickness, respectively, with layers A and E each comprising a linear low density polyethylene hexene-copolymer, layers B and D each comprising a metallocene catalyzed linear low density polyethylene copolymer, and each layer C comprising a linear low density polyethylene hexene-copolymer.

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Claim ~~27~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the resin density for each layer is about 0.880 to 0.930 g/cc.

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Claim ~~28~~ (Amended). The multi-layer, thermoplastic stretch wrap film of claim 1, wherein the resin density for each layer is about 0.900 to 0.925 g/cc.

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Claim ~~29~~ (Amended). A multi-layer, thermoplastic stretch wrap film containing seven polymeric layers, comprising:

(a) two outer layers, at least one of which having a cling performance of at least 100 grams/inch, said outer layer being selected from the group consisting of linear low density polyethylene, very low density polyethylene, and ultra low density polyethylene resins, said resins being homopolymers, copolymers, or terpolymers, of ethylene and alpha-olefins; and

(b) five inner layers, with each layer being selected from the group consisting of linear low density polyethylene, very low density polyethylene, ultra low density polyethylene, and metallocene-catalyzed linear low density polyethylene resins; said resins being homopolymers, copolymers, or terpolymers, of ethylene and C₃ to C₂₀ alpha-olefins,

wherein at least one of said inner layers comprises a metallocene catalyzed linear low density polyethylene resin with a melt index of 0.5 to 3 dg/min and a melt index ratio of 16 to 80.